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(54) INFORMATION RECEIVING AND REPRODUCING APPARATUS AND INFORMATION RECORDING MEDIUM

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(57) ABSTRACT

In an apparatus for receiving a digital broadcasting, the apparatus become easier for a user to handle by supplying a recording medium in which service information containing information that cannot be obtained in the broadcasting are recorded to the user. An information receiving and reproducing apparatus comprises a detachable recording medium in which digital broadcasting service information are recorded, a reproducing control apparatus for selectively reproducing service information from the recording medium, means for generating an OSD (on-screen display) signal based on a reproduced signal, a decoding unit for decoding an encoded reproduced signal or an encoded received signal and an OSD synthesizing unit for synthesizing the OSD signal and a decoded video signal.

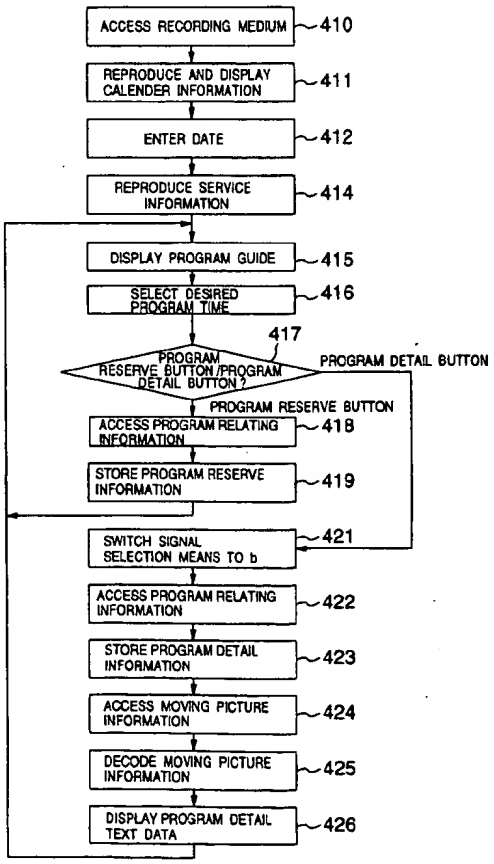
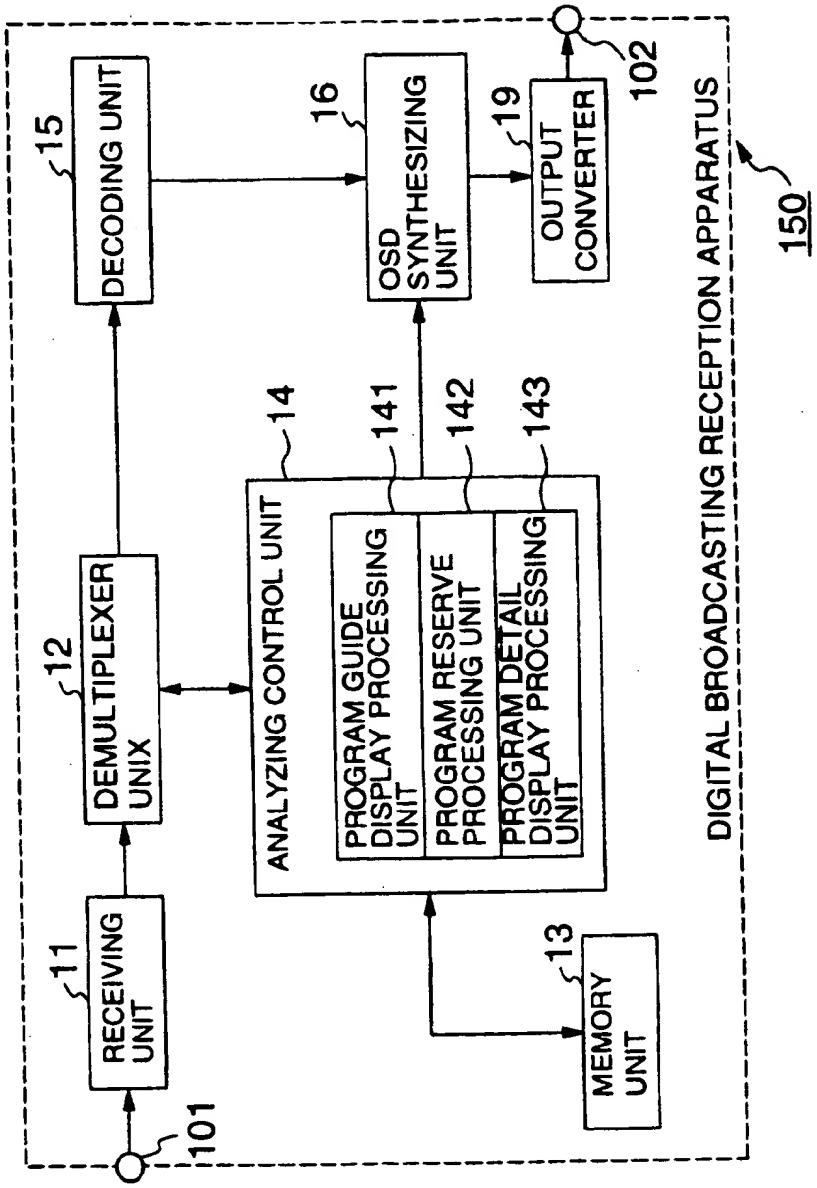


FIG.1
PRIOR ART



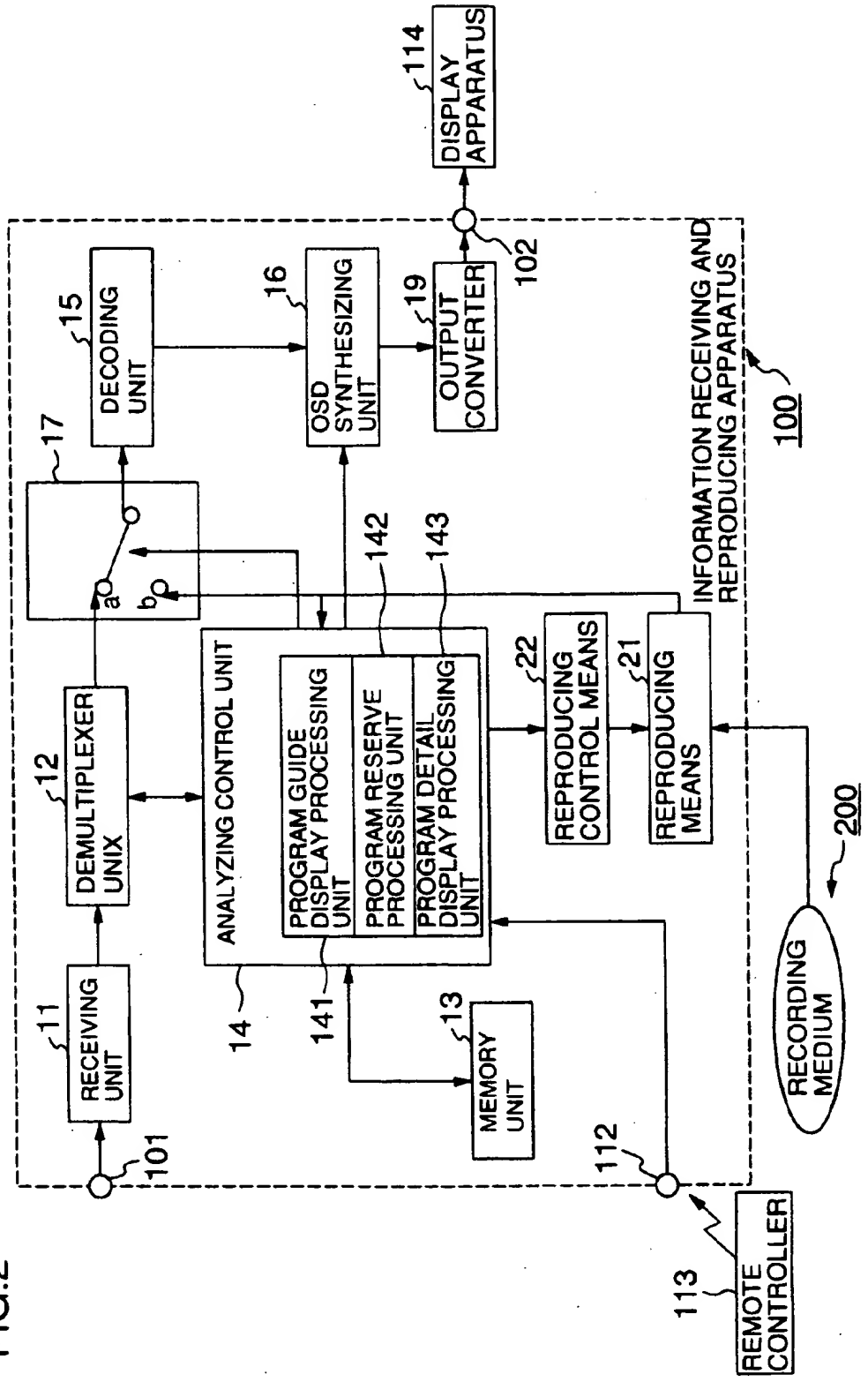

114
DISPLAY APPARATUS
102
INFORMATION RECEIVING AND REPRODUCING APPARATUS
100
16
OSD SYNTHESIZING UNIT
19
OUTPUT CONVERTER
15
DECODING UNIT
17
a
b
142
143
ANALYZING CONTROL UNIT
PROGRAM GUIDE DISPLAY PROCESSING UNIT
PROGRAM RESERVE PROCESSING UNIT
PROGRAM DETAIL DISPLAY PROCESSING UNIT
22
REPRODUCING CONTROL MEANS
21
REPRODUCING MEANS
12
DEMULTIPLEXER UNIX
11
RECEIVING UNIT
14
141
13
MEMORY UNIT
101
112
200
RECORDING MEDIUM
113
REMOTE CONTROLLER

FIG.2

FIG.3

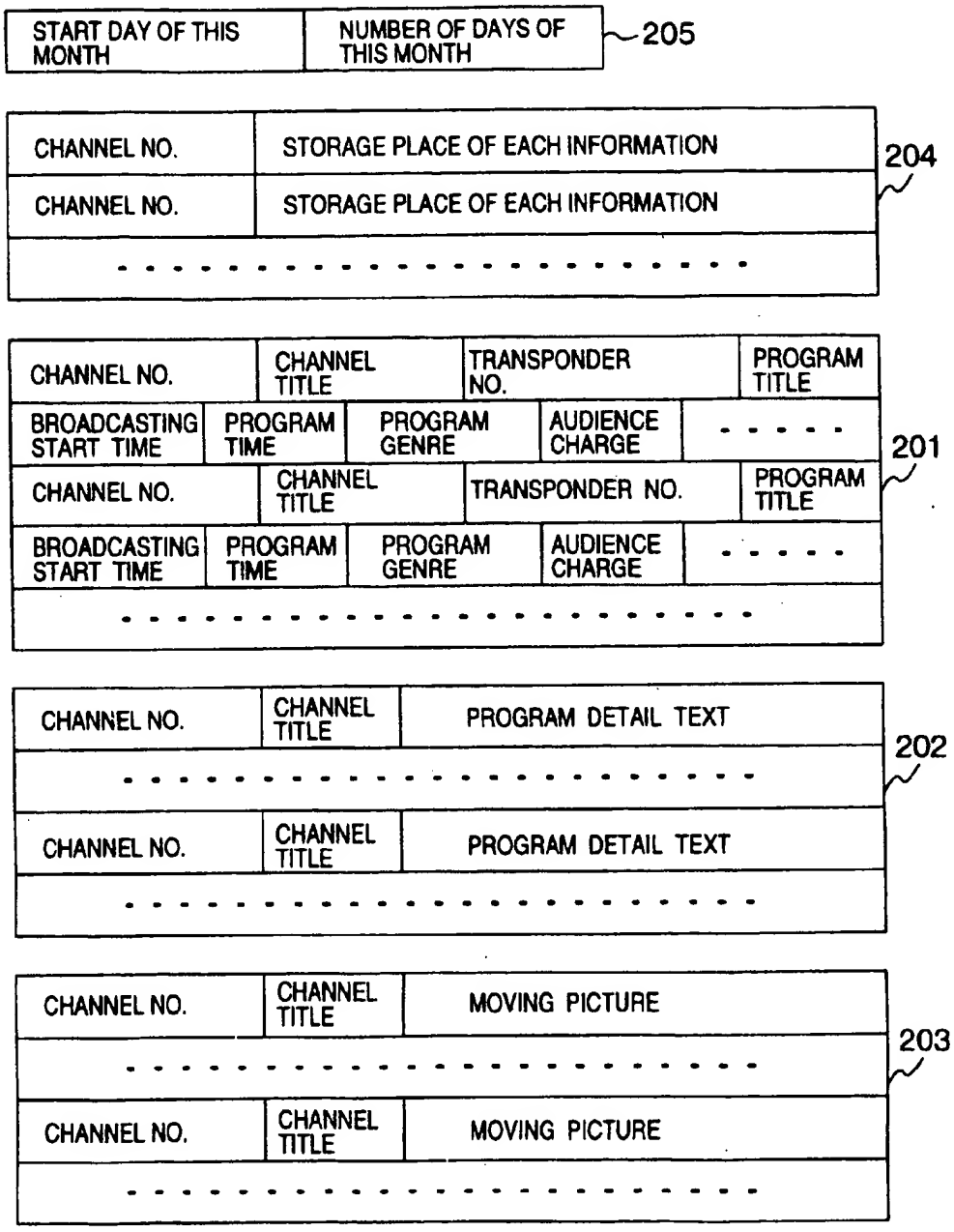

START DAY OF THIS MONTH
NUMBER OF DAYS OF THIS MONTH
205
CHANNEL NO.
STORAGE PLACE OF EACH INFORMATION
CHANNEL NO.
STORAGE PLACE OF EACH INFORMATION
204
CHANNEL NO.
CHANNEL TITLE
TRANSPONDER NO.
PROGRAM TITLE
BROADCASTING START TIME
PROGRAM TIME
PROGRAM GENRE
AUDIENCE CHARGE
CHANNEL NO.
CHANNEL TITLE
TRANSPONDER NO.
PROGRAM TITLE
BROADCASTING START TIME
PROGRAM TIME
PROGRAM GENRE
AUDIENCE CHARGE
201
CHANNEL NO.
CHANNEL TITLE
PROGRAM DETAIL TEXT
CHANNEL NO.
CHANNEL TITLE
PROGRAM DETAIL TEXT
202
CHANNEL NO.
CHANNEL TITLE
MOVING PICTURE
CHANNEL NO.
CHANNEL TITLE
MOVING PICTURE
203

FIG.4

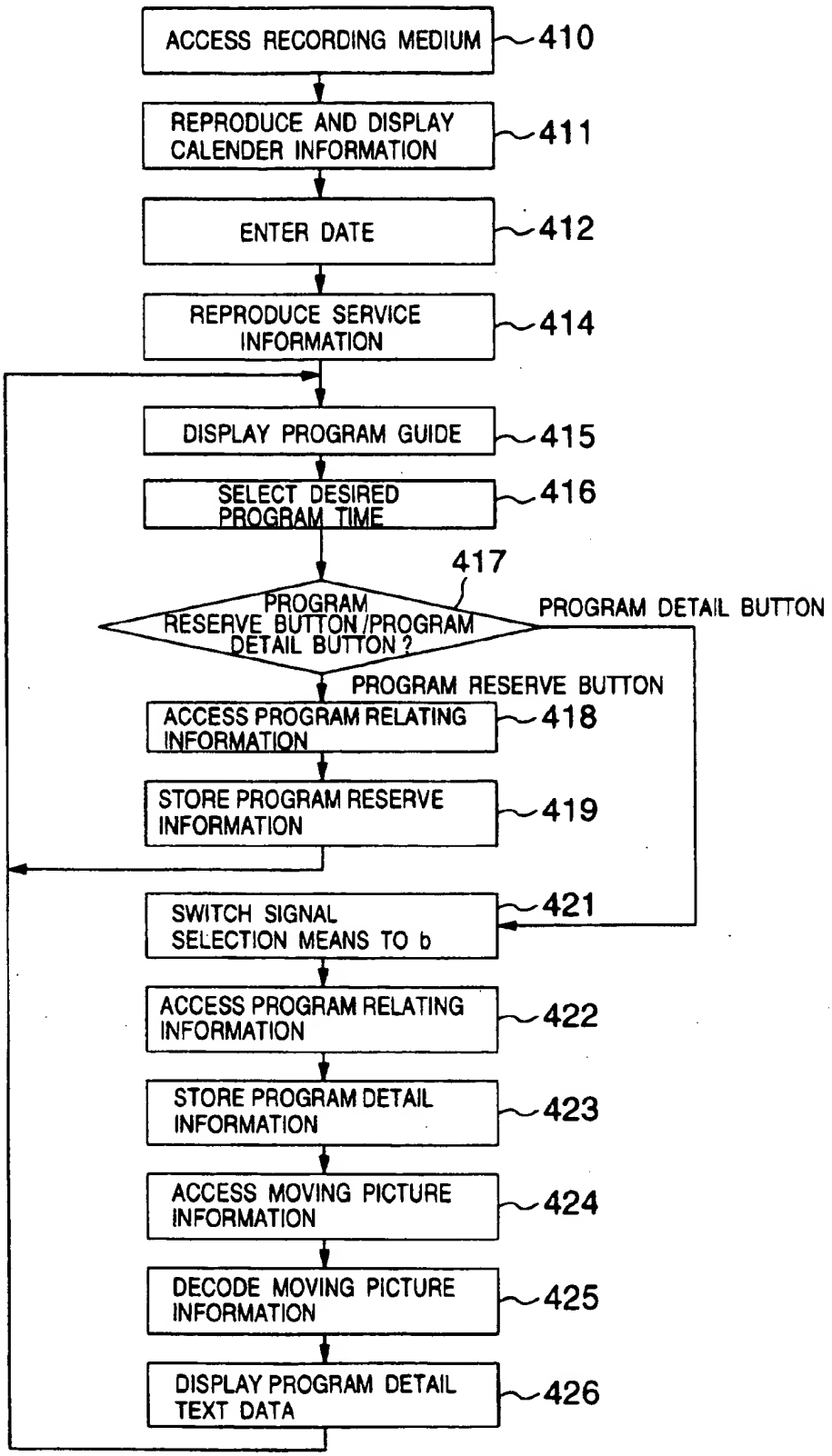
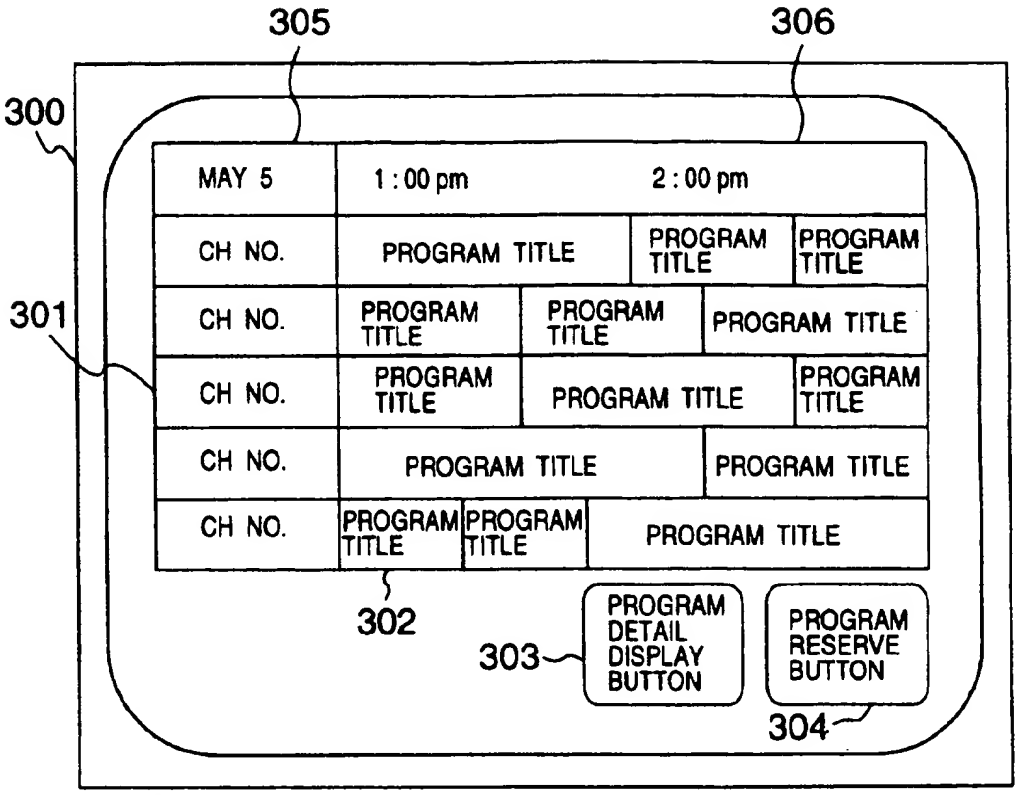

ACCESS RECORDING MEDIUM
410
REPRODUCE AND DISPLAY CALENDER INFORMATION
411
ENTER DATE
412
REPRODUCE SERVICE INFORMATION
414
DISPLAY PROGRAM GUIDE
415
SELECT DESIRED PROGRAM TIME
416
417
PROGRAM RESERVE BUTTON/PROGRAM DETAIL BUTTON ?
PROGRAM DETAIL BUTTON
PROGRAM RESERVE BUTTON
ACCESS PROGRAM RELATING INFORMATION
418
STORE PROGRAM RESERVE INFORMATION
419
SWITCH SIGNAL SELECTION MEANS TO b
421
ACCESS PROGRAM RELATING INFORMATION
422
STORE PROGRAM DETAIL INFORMATION
423
ACCESS MOVING PICTURE INFORMATION
424
DECODE MOVING PICTURE INFORMATION
425
DISPLAY PROGRAM DETAIL TEXT DATA
426

FIG.5


305
306
300
301
MAY 5
1 : 00 pm
2 : 00 pm
CH NO.
PROGRAM TITLE
PROGRAM TITLE
PROGRAM TITLE
CH NO.
PROGRAM TITLE
PROGRAM TITLE
PROGRAM TITLE
CH NO.
PROGRAM TITLE
PROGRAM TITLE
PROGRAM TITLE
CH NO.
PROGRAM TITLE
PROGRAM TITLE
CH NO.
PROGRAM TITLE
PROGRAM TITLE
PROGRAM TITLE
302
303
PROGRAM DETAIL DISPLAY BUTTON
PROGRAM RESERVE BUTTON
304

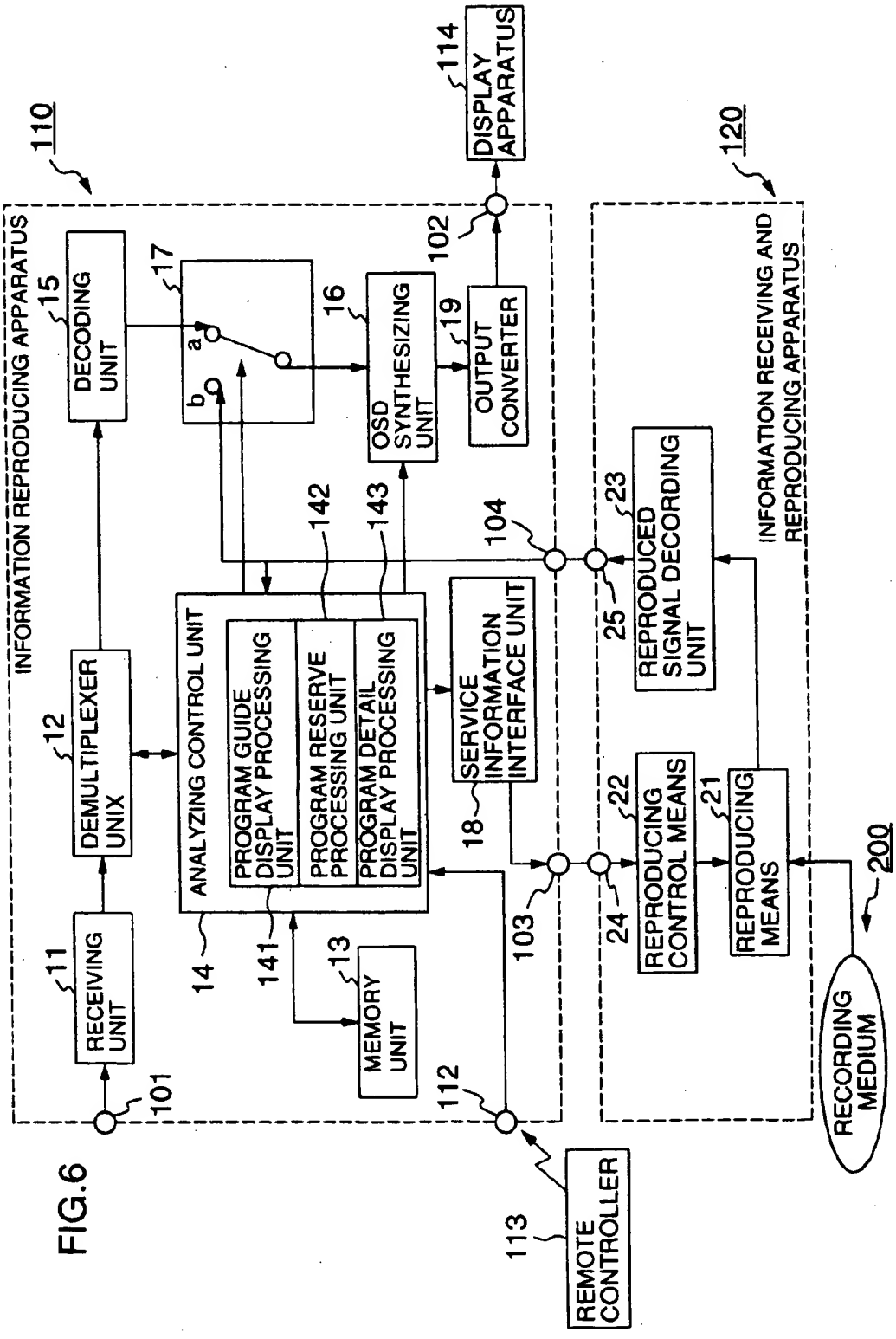

110
INFORMATION REPRODUCING APPARATUS
120
INFORMATION RECEIVING AND REPRODUCING APPARATUS
DISPLAY APPARATUS
114
102
DECODING UNIT
15
17
a
b
16
OSD SYNTHESIZING UNIT
19
OUTPUT CONVERTER
142
143
104
23
25
REPRODUCED SIGNAL DECORDING UNIT
DEMULTIPLEXER UNIX
12
ANALYZING CONTROL UNIT
PROGRAM GUIDE DISPLAY PROCESSING UNIT
PROGRAM RESERVE PROCESSING UNIT
PROGRAM DETAIL DISPLAY PROCESSING UNIT
SERVICE INFORMATION INTERFACE UNIT
18
22
21
REPRODUCING CONTROL MEANS
REPRODUCING MEANS
RECEIVING UNIT
11
14
141
13
MEMORY UNIT
103
24
200
101
112
RECORDING MEDIUM
113
REMOTE CONTROLLER

FIG.6

INFORMATION RECEIVING AND REPRODUCING APPARATUS AND INFORMATION RECORDING MEDIUM

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a digital broadcasting/communication reception and recording medium reproducing apparatus, and particularly relates to an information receiving and reproducing apparatus for analyzing service information from a broadcasting and a recording medium and controlling apparatus in accordance with analyzed service information and an information recording medium for use with the information receiving and reproducing apparatus.

[0002] JP-A-8-56350 describes a technology of a digital broadcasting reception system for selecting a desired program by receiving a digital signal in which a plurality of information are multiplexed and transmitted. In this conventional technology, there is described the digital broadcasting reception system in which a plurality of service information are added with identification data and thereby arranged in a specific format, program specification data indicating a corresponding relationship between the service information and the packet identification data also is arranged in a specific format by a packet and each program is searched from a multiplexed signal in which these packets are multiplexed and transmitted.

[0003] FIG. 1 of the accompanying drawings is a functional block diagram showing a digital broadcasting reception apparatus according to the prior art.

[0004] As shown in FIG. 1, in a digital broadcasting reception apparatus **150**, a modulated signal in which a plurality of multiplexed video and audio signals and/or data are modulated is inputted to an input terminal **101**. The input modulated signal is supplied from the input terminal **101** to a reception unit **11**, in which it is demodulated into an original multiplexed bit stream and then error-corrected. A demultiplexer unit **12** selects and extracts one desired encoded digital signal from the multiplexed bit stream under control of an analysis control unit **14**. The encoded digital signal from the demultiplexer unit **12** is supplied to a decoding unit **15**, in which it is decoded into an original digital video/audio signal.

[0005] The analysis control unit **14** includes a program guide display processing unit **141** for controlling a program guide display processing, a program reserve processing unit **142** for controlling a program reserve processing and a program detail display processing unit **143** for controlling a program detail display processing. The analysis control unit **14** analyzes received information, controls the respective units and generates OSD (on-screen display) data.

[0006] The program guide display processing unit **141** controls the demultiplexer unit **12** in order to obtain desired information. Service information thus obtained by this control is stored in a memory unit **13**.

[0007] The program guide display processing unit **141** generates OSD data of program guide based on the service information stored in the memory unit **13**.

[0008] An OSD synthesizing unit **16** synthesizes the OSD data from the analysis control unit **14** and the video signal decoded by the decoding unit **15** to provide digital synthesized video data. The digital video data from the OSD synthesizing unit **16** is supplied to a D/A (digital-to-analog) converter **19**, in which it is converted into an analog video signal. This analog video signal is outputted to an output terminal **102**. In this fashion, a program guide is displayed on a display apparatus (not shown).

[0009] To reserve a program, a user selects a desired program on a program guide, for example, displayed on a screen of a display apparatus. The program reserve processing unit **142** controls the demultiplexer unit **12** to extract information necessary for reserving a selected program, and stores the information thus extracted in the memory unit **13**.

[0010] The program reserve processing unit **142** controls the reception unit **11**, the demultiplexer unit **12** and the decoding unit **15** in accordance with the program reserve information stored in the memory unit **13** in such a manner that a reserved program may be received at a broadcasting start time of the reserved program.

[0011] In this fashion, the reserved program may be received at the broadcasting time of the reserved program and displayed on the screen of the display apparatus.

[0012] When program detail information is displayed, the program detail display processing unit **143** generates program detail text OSD data from program detail text data contained in the received service information.

[0013] The OSD synthesizing unit **16** synthesizes the OSD data from the analysis control unit **14** and the video signal decoded by the decoding unit **15** to provide digital synthesized video data. The digital video data from the OSD synthesizing unit **16** is outputted to the output terminal **102**. In this fashion, program detail information is displayed on a display apparatus (not shown).

[0014] When a program guide is displayed on the screen of the display apparatus by the prior-art digital broadcasting reception apparatus, received service information is temporarily stored in the memory **13**, and a program guide is created by retrieving information such as a program title or a broadcasting time necessary for a program from the service information. In most cases, service information transmitted by the broadcasting generally covers a program guide of about one week. Hence, the user cannot obtain service information covering one week or longer on the screen of the display apparatus. Therefore, the program reserve may cope with only a program within one week.

[0015] Further, in the digital broadcasting, there is transmitted program detail text data in order to explain contents of a program. The user is able to learn the contents of program before a broadcasting start time of a desired program by reading a program detail text. However, it is frequently observed that, depending upon the contents of program, the user becomes unable to understand the contents of program only by reading the program detail text.

SUMMARY OF THE INVENTION

[0016] In view of the aforesaid aspect, it is an object of the present invention to provide an information receiving and reproducing apparatus using a recording medium in which there are recorded service information whose amount of

information is larger than that of service information transmitted via a digital broadcasting in a digital broadcasting reception apparatus.

[0017] It is another object of the present invention to provide an information receiving and reproducing apparatus capable of displaying moving picture information indicative of contents of program as service information except a program detail text.

[0018] The present invention may be achieved by reception means for receiving and demodulating a modulated broadcasting/communication signal in which video/audio data are encoded/multiplexed, demultiplexer means for demultiplexing a first desired signal from the signal demodulated by the reception means, reproducing means for reproducing a signal from a detachable recording medium and outputting a reproduced signal as a second signal, signal selection means for selecting and outputting the first signal demultiplexed by the demultiplexer means and the second signal reproduced by the reproducing means, decoding means for decoding the first or second signal selected by the signal selection means, OSD (on-screen display) synthesizing means for synthesizing a signal decoded by the decoding means with an OSD signal and an analyzing control means for analyzing the first control signal demultiplexed by the demultiplexer means and the second control signal reproduced by the reproducing means and controlling the signal selection means and the OSD synthesizing means.

[0019] According to the present invention, a DVD (Digital Versatile Disc) is used as a recording medium, service information containing program moving picture information composed of promotion video/audio data of respective programs of broadcasting of one month, for example, are recorded on the recording medium and information recorded on the recording medium is reproduced, analyzed and displayed on a display apparatus, whereby a user is able to obtain information, which cannot be obtained only by received service information, on the display apparatus. Furthermore, since there are obtained service information of one month, for example, it becomes possible for the user to reserve programs of one month or shorter. Hence, the user may use an information receiving and reproducing apparatus and an information recording medium more conveniently.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] **FIG. 1** is a functional block diagram showing an example of a digital broadcasting reception apparatus according to the prior art;

[0021] **FIG. 2** is a block diagram showing an information receiving and reproducing apparatus according to an embodiment of the present invention;

[0022] **FIG. 3** is a diagram showing a format of information recorded on a recording medium according to the present invention;

[0023] **FIG. 4** is a flowchart to which reference will be made in explaining an operation of the information receiving and reproducing apparatus according to the embodiment shown in **FIG. 2**;

[0024] **FIG. 5** is a diagram showing the manner in which a program guide is displayed according to the present invention; and

[0025] **FIG. 6** is a diagram showing an information receiving and reproducing apparatus according to another embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0026] An information receiving and reproducing apparatus according to the present invention will hereinafter be described with reference to the drawings.

[0027] **FIG. 2** is a block diagram showing an information receiving and reproducing apparatus according to a first embodiment of the present invention. In **FIG. 2**, elements and parts identical to those of **FIG. 1** are marked with the same reference numerals.

[0028] As shown in **FIG. 2**, an information receiving and reproducing apparatus generally depicted by reference numeral **100** comprises the input terminal **101** to which a modulated signal in which several video/audio/data are encoded and multiplexed is inputted, the reception unit **11**, the demultiplexer unit **12**, the analyzing control unit **14**, the memory unit **13**, the decoding unit **15**, the OSD synthesizing unit **16**, the output converter **19** for converting the output signal from the OSD synthesizing unit **16** into a signal suitable for display, the output terminal **102** from which the signal from the output converter **19** is outputted, the signal selection means **17**, the reproducing means **21** and the reproducing control unit **22**. Service information recorded on a recording medium **200** is reproduced by the reproducing means **21**.

[0029] The analyzing control unit **14** includes the program guide display unit **141** for controlling a program guide display processing, the program reserve processing unit **142** for controlling a program reserve processing and the program detail display processing unit **143** for controlling a program detail display processing. The analyzing control unit **14** controls respective units by analyzing received or reproduced information, and generates OSD data.

[0030] The reception unit **11** demodulates the received signal from the input terminal **101** to provide an original multiplexed bit stream signal, and also corrects an error occurred during the transmission.

[0031] The demultiplexer unit **12** selects and extracts a desired video/audio and/or data signal from the multiplexed bit stream signal. The bit stream signal is generally an encoded digital signal string in which a plurality of service information containing video and audio data are multiplexed along a time-base direction and arranged in a specific packet form.

[0032] When a user operates a remote controller **113**, a remote control command signal from the remote controller **113** is received at a remote control reception unit **112**. The analyzing control signal **14** identifies a necessary packet signal string based on the remote control command signal supplied thereto through the remote control reception unit **112**, and instructs packet ID to the demultiplexer unit **12**. As a consequence, the demultiplexer unit **12** selects only a packet of necessary channel based on a packet identification signal PID attached to the start of each packet, and transmits the selected packet to the signal selection means **17**. If the designated packet ID is service information, then a packet of selected service information is stored in the memory unit **13** as service information.

[0033] The recording medium **200** is a medium such as a DVD in which there are previously recorded broadcasting service information. The recording medium **200** is detachable from the reproducing means **21**.

[0034] The reproducing means **21** reproduces information from the recording medium **200** under control of the reproducing control unit **22**.

[0035] The signal selection means **17** selects one of two signals supplied thereto from the demultiplexer unit **12** and the reproducing means **21**.

[0036] The decoding unit **15** decodes the encoded signal supplied thereto from the signal selection means **17**.

[0037] The OSD synthesizing unit **16** synthesizes the OSD data and the decoded video signal. Incidentally, OSD data such as program guide may be either displayed together with a received picture or displayed solely.

[0038] The analyzing control unit **14** includes a CPU (central processing unit) which is operable based on a program recorded on a memory. While the remote controller **113** is used in the embodiment shown in **FIG. 2**, the present invention is not limited thereto, and an input device such as a mouse or keyboard may be used.

[0039] An operation of the information receiving and reproducing apparatus **100** according to this embodiment will be described below.

[0040] Initially, the manner in which a digital broadcasting is received and a program guide is displayed on a display apparatus by using received service information will be described.

[0041] When a program guide is displayed on the display apparatus, a digital signal in which a plurality of information are multiplexed is inputted to the input terminal **101**, and then digital signal is demodulated by the reception unit **11**.

[0042] The program guide display processing unit **141** controls the signal selection means **17** in such a manner as to select a signal a from the demultiplexer unit **12**. Also, the program guide display processing unit **141** controls the demultiplexer unit **12** in order to obtain desired information. The service information thus obtained in the analyzing control unit **14** is stored in the memory unit **13**.

[0043] The decoding unit **15** decodes signals successively outputted from the demultiplexer unit **12**.

[0044] The program guide display processing unit **141** generates program guide OSD data based on the service information stored in the memory unit **13**.

[0045] The OSD synthesizing unit **16** synthesizes the OSD data from the analyzing control unit **14** and the video signal decoded by the decoding unit **15**. The synthesized digital data from the OSD synthesizing unit **16** is converted into an analog signal by the output converter **19**, and outputted to the output terminal **102**. In this fashion, the program guide is displayed on a screen of a display apparatus **114**.

[0046] When a program is reserved, a user selects a desired program on a program guide picture displayed on the screen of the display apparatus **114**. The program reserve processing unit **142** controls the demultiplexer unit **12** to extract information necessary for the selected program such as a program broadcasting start time or a transponder number, and stores the extracted information in the memory unit **13**. The program reserve processing unit **142** controls the reception unit **11**, the demultiplexer unit **12**, the signal selection means **17** and the decoding unit **15** in such a manner that a reserved program can be received at the broadcasting start time of the reserved program in accordance with the program reserve information stored in the memory unit **13**. Specifically, the reception unit **11** is controlled in the setting of a frequency of a transponder in order to select desired one transponder from a plurality of transponders through which bit stream data are transmitted. The demultiplexer unit **12** is controlled in such a manner that a reserve channel identification signal PID is set and only the packet thereof is selected. The signal selection means **17** is controlled in such a way as to select an input terminal a in order to reproduce a signal which is received at present. The decoding unit **15** is controlled such that it expands compressed video and audio signals to provide original video and audio signals.

[0047] In this manner, the reserved program may be received at the broadcasting time of the reserved program and displayed on the screen of the display apparatus **114**.

[0048] When program detail information is displayed, the program detail display processing unit **143** controls the demultiplexer unit **12** such that program detail information is extracted from received service information and stored in the memory unit **13**. The program detail display processing unit **143** generates program detail text OSD data based on the program detail information stored in the memory unit **13**.

[0049] The OSD synthesizing unit **16** synthesizes the OSD data from the analyzing control unit **14** and the video signal decoded by the decoding unit **15**. The thus synthesized digital data is converted by the output converter **19** and then outputted to the output terminal **102**.

[0050] In this fashion, program detail information is displayed on the screen of the display apparatus **114**.

[0051] The manner in which a program is displayed by using information recorded on the recording medium **200** will be described next.

[0052] The recording medium **200** is a DVD, for example, sent from a broadcasting enterprise to each user periodically, e.g. once per month. In this recording medium **200**, there are recorded service information of a corresponding period (one month). Initially, information recorded on the recording medium **200** will be described.

[0053] **FIG. 3** shows an example of service information recorded on the recording medium **200**. As shown in **FIG. 3**, service information recorded on the recording medium **200** comprises program guide information **201** indicating attribute information of at least each program, program detail information **202** indicating contents of program, program moving picture information **203** for the promotion of each program, program relation information **204** for relating the program guide information **201** to the program moving picture information **203** and calendar information **205**.

[0054] In the program guide information **201**, information such as channel title, transponder number, program title of each program, broadcasting time, program genre or audience charge are arranged from top to bottom in the sequential

order of channel numbers, and are also arranged from left to right in the sequential order of time.

[0055] In the program detail information **202**, information such as program detail text of each program are arranged in the sequential order similar to that of the program guide information **201**.

[0056] In the program moving picture information **203**, promotion video/audio data of each program, for example, are encoded as moving picture data by an MPEG2 (Moving Picture Experts Group 2) system and arranged in the sequential order similar to that of the program guide information **201**.

[0057] The program relation information **204** relates each information by indicating places where the program guide information **201**, the program detail information **202** and the program moving picture information **203** of each channel are stored.

[0058] The calendar information **205** is date information of the corresponding month.

[0059] The program guide information **201** to the program relating information **204** are generated at every date of the calendar information **205**.

[0060] While the program guide display processing unit **141**, the program reserve processing unit **142** and the program detail display processing unit **143** are independently illustrated in **FIG. 2**, there is programmed such that the CPU in the analyzing control unit **14** can execute all operations of these processing units **141**, **142** and **143**. The user sends a command signal to the analyzing control unit **14** by operating the remote controller **113** in such a manner that desired data may be displayed on the screen of the display apparatus **114**.

[0061] The manner in which a program is displayed by using the recording medium **200** will be described with reference to FIGS. **2** to **4**.

[0062] Initially, when a user instructs a display of calendar by operating the remote controller **113**, the analyzing control unit **14** accesses the recording medium **200** (step **410**), and controls the reproducing control unit **22** in such a way as to reproduce the calendar information **205** recorded on the recording medium **200** (step **411**). The reproducing control unit **22** controls the reproducing means **21** to reproduce the calendar information **205** from the recording medium **200**. The analyzing control unit **14** generates calendar picture OSD data based on the calendar information **205** thus reproduced. The OSD synthesizing unit **16** synthesizes the calendar picture OSD data from the analyzing control unit **14** and the video signal decoded by the decoding unit **15**. The thus synthesized digital data is converted by the output converter **19** and then outputted to the output terminal **102**. In this manner, a calendar picture is displayed on the screen of the display apparatus **114**.

[0063] When the user selects a desired date on the calendar picture by operating cursor keys on the remote controller **113** (step **412**), the analyzing control unit **14** controls the reproducing control unit **22** in such a manner as to reproduce the program relating information **204** (step **414**). Under control of the reproducing control unit **22**, the reproducing means **21** reproduces the program relating information **204**. The program guide display processing unit **141** controls the reproducing control unit **22** such that the program guide information **201** of the selected date is reproduced in accordance with the reproduced program relating information **204**. The reproducing control unit **22** controls the reproducing means **21** such that the reproducing means **21** reproduces the program guide information **201**. The program guide display processing unit **141** stores the reproduced program guide information **201** in the memory unit **13**. The program guide display processing unit **141** generates program guide picture OSD data based on the program guide information stored in the memory unit **13** (step **415**). The OSD synthesizing unit **16** synthesizes the program guide picture OSD data of the selected date and the video signal decoded by the decoding unit **15**. The thus synthesized digital data from the OSD synthesizing unit **16** is converted by the output converter **19** and then outputted to the output terminal **102**.

[0064] In this manner, the program guide of the selected date is displayed on the screen of the display apparatus **114**.

[0065] **FIG. 5** shows an example of a program guide displayed on a screen **300** of the display apparatus **114**. As shown in **FIG. 5**, a program guide displayed on the screen **300** of the display apparatus **114** comprises a channel NO. column **301** of program guide, a program title column **302** of program guide, a date column **305** of program guide and a broadcasting time column **306** of program guide. Further, on the screen **300** of the display apparatus **114**, there are displayed a program detail display button **303** and a program reserve button **304**.

[0066] The manner in which a program is reserved will be described below. Under the condition that the program guide shown in **FIG. 5** is displayed, the user selects the desired program title **302** by operating the cursor keys on the remote controller **113** (step **416**), and then selects the program reserve button **304**. The program reserve processing unit **142** controls the reproducing control unit **22** in such a manner as to reproduce the program relating information **204** recorded on the recording medium **200** (step **418**). Under control of the reproducing control unit **22**, the reproducing means **21** reproduces the program relating information from the recording medium **200**. The program reserve processing unit **142** controls the reproducing control unit **22** in such a manner that the program guide information **201** in which information of the selected program is reproduced in accordance with the reproduced program relating information **204**. The reproducing control unit **22** controls the reproducing means **21** such that the reproducing means **21** may reproduce the program guide information **201**.

[0067] The program reserve processing unit **142** extracts information necessary for reserving the selected program, such as a program broadcasting start time or a transponder No. from the reproduced program guide information **201**, and stores the thus extracted information in the memory unit **13** (step **419**).

[0068] The program reserve processing unit **142** controls the receiving unit **11**, the demultiplexer unit **12**, the signal selecting means **17** and the decoding unit **15** in such a manner that the reserved program may be received at the reserved program broadcasting start time in accordance with the program reserve information stored in the memory unit **13**.

[0069] In this manner, the reserved program may be received at the reserved program broadcasting time and displayed on the display apparatus **114**.

[0070] The manner in which program detail information is displayed will be described. Under the condition that the program guide shown in **FIG. 5** is displayed on the screen **300** of the display apparatus **114** (step **415**), the user selects a desired program title **302** (step **416**), and selects the program detail display button **303** (step **417**). The program detail display processing unit **143** controls the signal selecting means **17** in such a manner that the signal selecting means **17** may select an input terminal b (step **421**). Also, the program detail display processing unit **143** controls the reproducing control unit **22** in such a manner as to reproduce the program relating information **204** (step **422**). The reproducing control unit **22** controls the reproducing means **21** such that the reproducing means **21** may reproduce the program relating information **204**. The program detail display processing unit **143** controls the reproducing control unit **22** in such a manner that the program detail information **202** of the selected program and the program moving picture information **203** are reproduced in accordance with the reproduced program relating information **204** (steps **422** and **424**). The reproducing control unit **22** controls the reproducing means **21** in such a manner as to reproduce the program detail information **202** and the program moving picture information **203**. The program detail display processing unit **143** stores the reproduced program detail information **202** in the memory unit **13** (step **423**).

[0071] Since the program relating information **204** shown in **FIG. 3** indicates the address in which each information is stored, the analyzing control unit **14** transfers the program detail information **202** to the memory unit **13** and also transfers the program moving picture information **203** through the selecting means **17** to the decoding unit **15** based on the address information.

[0072] Accordingly, when the program moving picture information is reproduced, the analyzing control unit **14** controls the decoding unit **15** in such a manner that the decoding unit **15** may decode the moving picture information (step **425**). As a result, the decoding unit **15** decodes moving picture data from the reproduced program moving picture information **203**.

[0073] The program detail display processing unit **143** generates the program detail text OSD data based on the program detail information **202** stored in the memory unit **13** (step **426**). The OSD synthesizing unit **16** synthesizes the moving picture data decoded by the decoding unit **15** and the program detail text OSD data. The thus synthesized digital data is supplied to the output converter **19**, in which it is converted into an analog signal and then outputted to the output terminal **102**. In this manner, a program detail picture containing the moving picture of the selected program is displayed on the screen **300** of the display apparatus **114**.

[0074] Incidentally, moving picture information generally has a reproducing time of about 1 to 2 minutes, and the user may freely make programming such that the moving picture information may be reproduced repeatedly or original program guide may be displayed after the reproduction of moving picture information was completed.

[0075] As described above, since the apparatus for receiving the digital broadcasting and the apparatus for reproducing the recording medium in which broadcasting service information are recorded are integrally formed as one body, the user may obtain information, which cannot be obtained only by the broadcasting, on the screen, thereby making the apparatus become easier to handle.

[0076] Another embodiment of the present invention will be described below with reference to the drawings. **FIG. 6** is a block diagram showing an information receiving and reproducing apparatus according to the second embodiment of the present invention.

[0077] In this embodiment, it is to be noted that the information receiving and reproducing apparatus consists of an information receiving apparatus **110** and an information reproducing apparatus **120**. In **FIG. 6**, elements and parts identical to those of the information receiving and reproducing apparatus **100** shown in **FIG. 2** are marked with same reference numerals.

[0078] As shown in **FIG. 6**, the information receiving apparatus **110** includes, in addition to the arrangement of the reception processing unit of the information receiving and reproducing apparatus **100** shown in **FIG. 2**, a control signal output terminal **103**, a reproduced signal input terminal **104** and a service information interface unit **18** for controlling the reception and transmission of information between the analyzing control unit **14** and a reproducing control unit **22** disposed in the information reproducing apparatus **120**.

[0079] As shown in **FIG. 6**, the signal selecting means **17** is connected behind the decoding unit **15**, and selects one of the input terminal a for the decoded received signal from the decoding unit **15** and the input terminal b for the decoded reproduced signal from the reproduced signal decoding unit **23**.

[0080] As shown in **FIG. 6**, the information reproducing apparatus **120** includes, in addition to the arrangement of the reproducing processing unit of the information receiving and reproducing apparatus **100** shown in **FIG. 2**, a control signal input terminal **24**, a reproduced signal output terminal **25** and the reproduced signal decoding unit **23** for decoding the encoded signal recorded on the recording medium **200**.

[0081] An operation of this embodiment will be described below. The second embodiment differs from the first embodiment shown in **FIG. 2** in that the information receiving and reproducing apparatus comprises the information receiving apparatus **110** and the information reproducing apparatus **120** wherein a signal between the analyzing control unit **14** and the reproducing control unit **22** is supplied via the service information interface unit **18**, the control signal output terminal **103** and the control signal input terminal **24**, the decoded signal is inputted to the signal selecting means **17** and that moving picture data recorded on the recording medium **200** is decoded by the reproduced signal decoding unit **23** disposed within the information reproducing apparatus **120** and inputted to the signal selecting means **17** through the reproduced signal output terminal **25** and the reproduced signal input terminal **104**. A rest of the second embodiment is the same as that of the first embodiment.

[0082] An operation of the second embodiment will be described below with reference to the above-mentioned points different from those of the first embodiment.

[0083] When information recorded on the recording medium **200** is reproduced, the service information interface unit **18** converts the control signal from the analyzing

control unit **14** into the control signal of the reproduced control unit **22** and outputs the thus converted control signal to the control signal output terminal. The signal outputted from the control signal output terminal **103** is inputted to the control signal input terminal **24**.

[0084] The reproducing control unit **22** controls the reproducing means **21** in accordance with the control signal inputted from the control signal input terminal **24** in such a manner that the reproducing means **21** reproduces the information from the recording medium **200**. The analyzing control unit **14** stores the reproduced program guide information **201** or the like in the memory unit **13**.

[0085] When moving picture data is reproduced, under control of the analyzing control unit **14**, the reproduced signal decoding unit **23** decodes moving picture data of the program moving picture information, and the signal selecting means **17** selects the decoded reproduced signal from the reproduced signal decoding unit **23**. The reproduced signal decoding unit **23** decodes moving picture data in the program moving picture information **203** reproduced by the reproducing means **21**, and outputs the thus decoded moving picture data to the reproduced signal output terminal **25**. The decoded moving picture data signal outputted from the reproduced signal output terminal **25** is inputted through the reproduced signal input terminal **104** to the signal selecting means **17**.

[0086] An operation in which OSD data is generated, synthesized to the video signal and then outputted is similar to that of the first embodiment.

[0087] As described above, since the apparatus for receiving the digital broadcasting and the apparatus for reproducing the recording medium in which service information are recorded are used, the user may obtain information, which cannot be obtained from the received service information only, on the display apparatus, thereby making the information receiving and reproducing apparatus become easier for the user to handle.

[0088] As described above, according to the present invention, since there are used the recording medium (e.g. DVD) in which there are recorded service information containing moving picture information comprised of promotion video/audio data of respective programs of broadcasting of one month, for example, and the information receiving and reproducing apparatus for analyzing received or recorded information to control respective units, the user may obtain information, which cannot be obtained from received service information only, on the display apparatus. Furthermore, since service information of one month, for example, may be obtained, it becomes possible to reserve programs within one month. Thus, the information receiving and reproducing apparatus according to the present invention becomes easier for the user to handle.

[0089] Having described preferred embodiments of the invention with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments and that various changes and modifications could be effected therein by one skilled in the art without departing from the spirit or scope of the invention as defined in the appended claims.

What is claimed is:

1. An information receiving and reproducing apparatus comprising:

input control apparatus for commanding the selection of desired signal or information data to be displayed;

receiving apparatus for receiving an encoded/multiplexed transmission signal to separate and extract a desired first signal or desired first information data from said received transmission signal under control of said input control apparatus;

reproducing units for reproducing a desired second signal or desired second information data from information recorded on a detachable recording medium under control of said input control apparatus;

selecting means for selecting one of said first signal separated and extracted by said receiving apparatus and said second signal reproduced by said reproducing units under control of said input control apparatus;

a decoding unit for decoding said first or second signal selected by said selecting means;

OSD generating means for generating OSD data based on said first information data separated and extracted by said receiving apparatus or said second information data reproduced by said reproducing units;

an OSD synthesizing unit for synthesizing said OSD data from said OSD generating means to a decoded signal from said decoding unit; and

output means for outputting a signal from said OSD synthesizing unit to a display apparatus.

2. An information receiving and reproducing apparatus as claimed in claim 1, wherein said input control apparatus includes input control apparatus includes input apparatus for commanding the selection of desired signal or information data to be displayed and a control unit for controlling said receiving apparatus, said reproducing units and said selecting means based on commands from said input apparatus.

3. An information receiving and reproducing apparatus as claimed in claim 1, wherein said receiving apparatus is a packet demultiplex apparatus.

4. An information receiving and reproducing apparatus as claimed in claim 3, wherein said transmission signal is a modulated signal and said information receiving and reproducing apparatus includes a receiving unit for demodulating said modulated signal to provide an encoded/multiplexed signal.

5. An information receiving and reproducing apparatus as claimed in claim 1, wherein said second signal is moving picture information.

6. An information receiving and reproducing apparatus as claimed in claim 1, wherein said first and second information data are service information data.

7. An information receiving and reproducing apparatus as claimed in claim 6, wherein said service information data includes a program guide in which programs are displayed for every channel and in the sequential order of time and program detail information indicative of contents of each program.

8. An information receiving and reproducing apparatus as claimed in claim 7, wherein said OSD generating means generates said OSD data containing said program guide displayed on said display apparatus and at least one of a reserve key used to reserve a desired program designated when said desired program is designated from said program guide and a content key for displaying said program detail

information corresponding to said desired program based on said first or second information data.

9. An information receiving and reproducing apparatus according to claim 8, further comprising means for reserving said designated program when said reserve key is selected by said input control apparatus.

10. An information receiving and reproducing apparatus according to claim 8, further comprising means for displaying contents of said designated program on said display apparatus based on said program detail information when said content key is selected by said input control apparatus.

11. An information receiving and reproducing apparatus according to claim 1, further comprising a memory unit for memorizing said first information data from said receiving apparatus and said second information data from said reproducing unit and wherein said OSD generating means generates said OSD data based on information data memorized in said memory unit.

12. An information receiving and reproducing apparatus according to claim 1, wherein said output means includes an output converter for converting a signal from said OSD synthesizing unit into a signal suitable for said display apparatus.

13. An information receiving and reproducing apparatus comprising:

input control apparatus for commanding the selection of desired signal or information data to be displayed;

receiving apparatus for receiving an encoded/multiplexed transmission signal to separate and extract a desired first signal or desired first information data from said received transmission signal under control of said input control apparatus;

a first decoding unit for decoding a first signal from said receiving apparatus;

reproducing units for reproducing a desired second signal or desired second information data from information recorded on a detachable recording medium under control of said input control apparatus;

a second decoding unit for decoding a second signal from said reproducing units;

selecting means for selecting one of said first signal decoded by said first decoding unit and said second signal decoded by said second decoding unit under control of said input control apparatus;

OSD generating means for generating OSD data based on said first information data separated and extracted by said receiving apparatus or said second information data reproduced by said reproducing units;

an OSD synthesizing unit for synthesizing said OSD data from said OSD generating means to a selected signal from said selecting means; and

display apparatus for outputting a signal from said OSD synthesizing unit to a display apparatus.

14. A recording medium which can be read out by a computer and wherein there are recorded:

date data within a predetermined time period;

program guide data in which respective programs are recorded for every channel in the sequential order of time at every date of said date data;

program detail data indicating contents corresponding to respective programs in said program guide data; and

program relating data indicating for relating storage places of said respective programs and said program detail data in order to define a corresponding relationship between respective programs in said program guide data and said program detail data.

15. A recording medium as claimed in claim 14, wherein said program detail data includes:

program detail text data indicating contents corresponding to programs in said program guide data; and

program detail moving picture data indicating contents corresponding to respective programs in said program guide data.

16. A recording medium as claimed in claim 15, wherein said program relating data relates storage places of said program detail text data and said program detail moving picture data to respective programs of said program guide data.

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